

Technology Opportunity

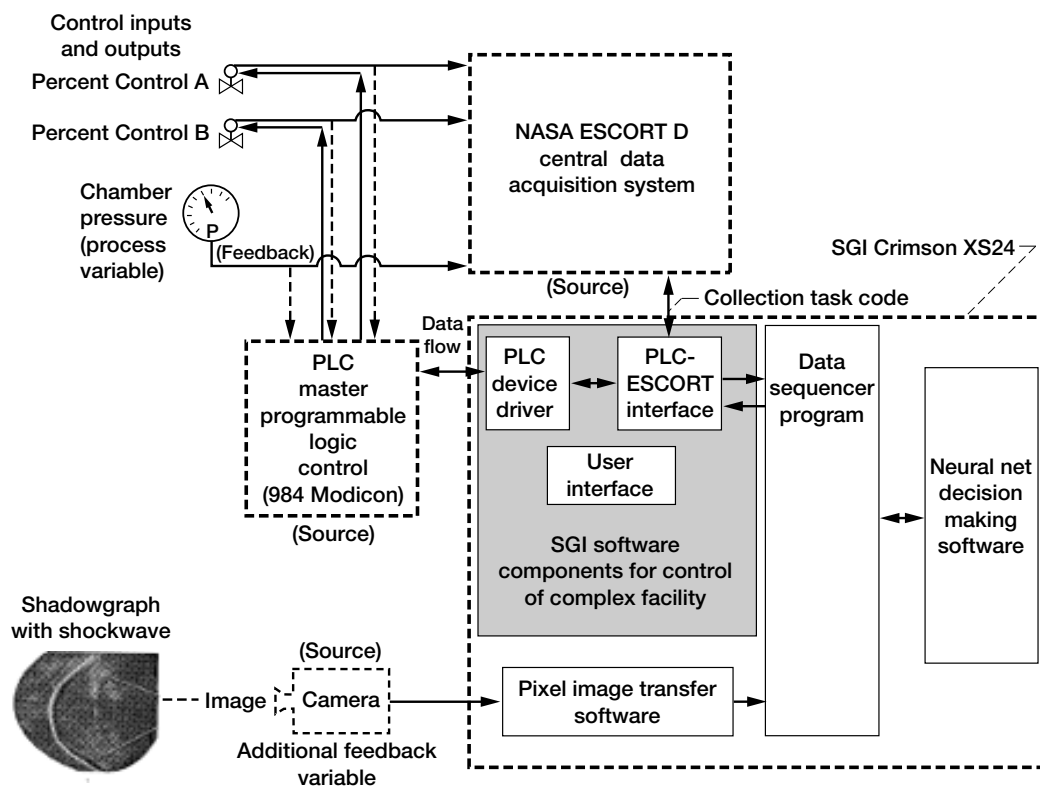
Software Communication Bridge

NASA Lewis Research Center contracted with the Bailey Controls Company to develop a communication interface between a Silicon Graphics, Inc. (SGI) computer and a Modicon Programmable Logic Controller (PLC). The programs that make up the software communication bridge provide a data transfer link that will allow a future closed-loop demonstration of automated, "hands off" command line control of the 3.8- by 10-in. Supersonic Wind Tunnel (SWT). The control of complex facility operations or critical manufacturing processes that require optimized and standardized performance can be improved by using this technique.

Potential Uses

- Automated, "hands off" operation of large wind tunnels and/or support facilities
- Automated, "hands off" control of critical operations or processes
- Standardized and repeatable performance of hazardous processes
- Repetitive processes associated with such industries as refining, metallurgy melt, automotive manufacturing, steel/aluminum sheet rolling, food, and aerospace that require quality control
- Adaptive control system companies and software development companies

Diagram of Data Flow (Arrows) and Software Pieces



Benefits

- Essential to improving and duplicating the control of complex operations or processes—allows “cloning” of expert corporate knowledge and senior operator experience
- User-friendly, flexible, adaptable, and easily administered; simple prompts or responses allow quick online changes to individual training sets or multiple training sets
- Simple test procedure to verify the interface’s functional integrity and maintained operational status
- Easy to load and run, and make minor changes or customizations to the communication interface
- Significantly fewer operations or process personnel required

The Technology

The software communication bridge, using subsets of existing Bailey software, allows a data exchange between an existing Modicon PLC and an existing UNIX-based SGI workstation. The accompanying diagram shows the major functions of the system, which consist of created data flow highways, or paths, between the neural net software, data sequence programs, SGI software, PLC components, sensor control data from ESCORT (central data acquisition system) and video frame grabber neural networks. Other parts of the system are control data flow, storage methods, data format, and timing maintenance with other software pieces or hardware.

Options for Commercialization

NASA Lewis Research Center would like to extend the use of this approach to improve the control of complex or critical auxiliary facility operations. The interactive software communication bridge between the SGI computer and the Modicon PLC is the first step to achieve repeated performance now and in future years without the training of personnel.

Because Bailey Controls Company’s has used proprietary Modbus Foreign Device Interface Driver (FDI) programs to develop the software for the SGI-to-Modicon-PLC communication link, all requests for usage licenses should be addressed to

Mr. Ray Champa
Bailey Controls Company
29801 Euclid Avenue
Wickliffe, OH 44092

One of NASA’s missions is to disseminate its technology; therefore, NASA Lewis encourages the commercialization of the technology associated with the automated, “hands off” command line control of the 3.8- by 10-in. SWT. For further information about artificial neural net interpretations of imaging and/or point sensor model data, please contact NASA Lewis.

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Key Words

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